

## REMARKS

Claims 12-22 are pending in the present application. Claims 21 and 22 have been withdrawn from consideration by restriction. Reexamination of the application and reconsideration of the rejections and objections are respectfully requested in view of the following remarks, which follow the order set forth in the Office Action.

### ***Rejections under 35 U.S.C. §103***

#### **I. Player**

Claims 12, 15, 16, and 19 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,256,186 to Player et al. (“Player”). Applicants respectfully traverse.

Claim 12 recites a process for the valorisation of metal values in a Zn-, Fe- and Pb-bearing residue, comprising the steps of subjecting the residue to a flash or agitated bath fuming step, thereby producing an Fe-bearing slag and Zn- and Pb-bearing fumes, and extracting the Zn- and Pb-bearing fumes and valorising Zn and Pb. Either one or more of CaCO<sub>3</sub>, SiO<sub>2</sub>, and MgCO<sub>3</sub> are added as a flux before or during the fuming step so as to obtain a final slag composition with the following:

$$\frac{[Fe]}{[SiO_2]} + \frac{[CaO]}{[SiO_2]} + \frac{[MgO]}{3} > 3.5; \quad (1)$$

$$0.1 < \frac{[CaO]}{[SiO_2]} < 1.3; \text{ and} \quad (2)$$

$$6 < [SiO_2] < 22. \quad (3)$$

All concentrations are expressed in wt%.

Applicants submit that Player fails to render claim 12 obvious because Player does not disclose or reasonably suggest all of the limitations of claim 12. Importantly, the final slag compositions disclosed in Player do not meet the requirements of the three equations recited in claim 12.<sup>1</sup> Specifically, Player fails to disclose or suggest a final slag composition meeting the requirement of the first equation. Table 3 of Player discloses the final slag compositions for 19 runs using Mix A and Mix B. None of the runs disclosed in Table 3 meet the requirement of equation 1 of claim 12. In fact, the highest value obtained for

<sup>1</sup> For the sake of consistency with the terminology used in the Office Action, Applicants are using the term “equations” to describe the mathematical formulas in claim 12. Applicants note that these formulas are actually correctly termed as inequalities rather than equations.

equation 1 using the final slag compositions disclosed in Table 3 is 2.30, which was obtained for run 6 and which is significantly lower than the a value of greater than 3.5, which is required for equation 1. A table showing the calculated values for equation 1 for the runs disclosed in Table 3 of Player is in Appendix A. Claim 12 requires that the *final* slag composition meet the requirements of the equations thereof. Thus, the *final* slag compositions disclosed in Player rather than the starting slag or intermediate slag compositions must be used in the equations of claim 12 when making an obviousness determination. A starting slag composition or an intermediate slag composition meeting the requirements of the equations of claim 12 does not meet the requirements of claim 12, especially in view of a final slag composition not meeting the requirements of the equations. Player does not disclose or reasonably suggest all of the limitations of claim 12, thus the Office Action fails to set forth a *prima facie* case of obvious for claim 12 in view of Player. Based on the foregoing, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

## II. Fugleberg

Claims 12-15 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,199,974 to Fugleberg (“Fugleberg”). Applicants respectfully traverse.

Applicants submit that Fugleberg fails to render claim 12 obvious because Fugleberg does not disclose or reasonably suggest all of the limitations of claim 12. Importantly, the final slag compositions disclosed in Fugleberg do not meet the requirements of the three formulas recited in claim 12. Specifically, Fugleberg fails to disclose or reasonably suggest a final slag composition meeting the requirement of the first equation. Examples 1 and 2 of Fugleberg disclose a range of final slag compositions. However, the final slag compositions disclosed for examples 1 and 2 do not meet the requirement of equation 1 of claim 12. Calculations were performed using various composition values within the range of composition values shown for the final slag in examples 1 and 2. These calculations are shown for Fugleberg in Appendix A. In order to try to obtain the highest value using the final slag compositions provided in examples 1 and 2, the highest percentage disclosed for Fe and CaO were used in conjunction with the lowest percentage disclosed for SiO<sub>2</sub>. These calculations are labeled as “hybrid” in Appendix A for examples 1 and 2. Even in these “hybrid” calculations, which result in the highest value possible for the given compositions, the highest value obtained was 2.79, which is significantly lower than a value of greater than

3.5, which is required for equation 1. As discussed above, claim 12 requires that the *final* slag composition meet the requirements of the equations thereof. Thus, the *final* slag compositions disclosed in Fugleberg rather than any starting slag or intermediate slag compositions must be used in the equations of claim 12 when making an obviousness determination. In fact, a starting slag composition or an intermediate slag composition meeting the requirements of the equations of claim 12 does not meet the requirements of claim 12. Fugleberg does not disclose or reasonably suggest all of the limitations of claim 12, thus the Office Action fails to set forth a prima facie case of obviousness for claim 12 in view of Fugleberg. Based on the foregoing, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

### **III. Fugleberg and Baldock**

Claim 16 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Fugleberg as applied to claim 12 above, and further in view of U.S. Patent No. 5,282,881 to Baldock et al. (“Baldock”). Applicants respectfully traverse.

Applicants submit that the combination of Fugleberg and Baldock fails to render claim 16 obvious because the combination does not disclose or reasonably suggest all of the limitations of claim 16. As discussed above, Fugleberg fails to disclose or reasonably suggest all of the limitations of claim 12, from which claim 16 depends. Baldock is not able to overcome the deficiencies of Fugleberg because Baldock also fails to disclose a final slag composition meeting the requirements of equation 1 of claim 12. Because the combined references do not teach all of the limitations of claim 16, the Office Action fails to set forth a prima facie case of obvious for claim 16 in view of the combined references. Based on the foregoing, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

### **IV. Fugleberg and SU ‘810**

Claims 19 and 20 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Fugleberg as applied to claim 12 above, and further in view of SU 1048810 (“SU ‘810”). Applicants respectfully traverse.

Applicants submit that the combination of Fugleberg and SU ‘810 fails to render claims 19 and 20 obvious because the combination does not disclose or reasonably suggest all of the limitations of claims 19 and 20. As discussed above, Fugleberg fails to disclose or

reasonably suggest all of the limitations of claim 12, from which claims 19 and 20 depend. SU '810 is not able to overcome the deficiencies of Fugleberg because SU '810 also fails to disclose a final slag composition meeting the requirements of equation 1 of claim 12. Because the combined references do not teach all of the limitations of claims 19 and 20, the Office Action fails to set forth a *prima facie* case of obvious for claims 19 and 20 in view of the combined references. Based on the foregoing, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

***Allowable Subject Matter***

The Office Action indicates that claims 17 and 18 have been objected to as being dependent on a rejected base claim, but would be considered allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

For the foregoing reasons, claim 12 and claims 13-20, which depend therefrom, are considered to be allowable. A Notice to this effect is respectfully requested. If any questions remain, the Examiner is invited to contact the undersigned at the number given below.

Respectfully submitted,

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# APPENDIX A

**Player**  
**USPN 5,256,186**

**Table 3 - Final slag composition**

<u>Run number</u>	<u>Fe</u> wt%	<u>SiO<sub>2</sub></u> wt%	<u>CaO</u> wt%	<u>MgO</u> wt%	<u>Equation 1 result</u>
1	30.3	21.2	6.5	1.16	2.12
2	29.2	21.9	7.3	0.95	1.98
3	25.4	19.3	5.8	1.36	2.07
4	25.7	18.6	4.7	1.34	2.08
5	26.3	20.3	5.9	1.77	2.18
6	24.8	18.1	7.7	1.51	2.30
7	20.5	14	5.3	1.12	2.22
8	17.1	11	3.7	1.06	2.24
9	15.5	10.7	4.4	0.91	2.16
10	12.5	11.3	6.6	0.82	1.96
11	15.7	11.1	4.1	0.56	1.97
12a	16.1	12.2	4.6	0.53	1.87
12b	16.1	11.8	4.5	0.61	1.95
13	12.9	10.8	6.4	0.6	1.99
14	14.4	12.1	7.6	0.71	2.05
15	18.1	14.1	5.5	0.64	1.89
16a	18.9	14.6	5.6	0.6	1.88
16b	18	15.5	5.5	0.58	1.71
17	15.7	13	7.2	0.85	2.04

**Fugleberg**  
**USPN 5,199,974**  
**Slag composition**

<u>Example</u>	<u>Fe</u> wt%	<u>SiO<sub>2</sub></u> wt%	<u>CaO</u> wt%	<u>MgO</u> wt%	<u>Equation 1 result</u>
1 (low end)	31	20	2.9	0	1.70
1 (high end)	46.2	28.8	5.4	0	1.79
2 (low end)	33.9	19.1	5.9	0	2.08
2 (high end)	42.5	24.8	10.7	0	2.15
1 hybrid					2.58
2 hybrid					2.79